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TEST RESULTS OF GRADATION FOR WMM

Lab ID : CP-RW-2018-12-31-139 **Date: 04-02-19**

Project Name : Package no.3 (Package Consists of 21 Works)

Name Of Work : Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 01-02-19

Type of Mix : WMM (Wet Mix Macadam)

Date of test : 01-02-19

Oven Dry Weight : 11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	316	316	2.9	97.1	95-100
22.4	2258	2574	23.4	76.6	60-80
11.2	2178	4752	43.2	56.8	40-60
4.75	2252	7004	63.7	36.3	25-40
2.36	1623	8627	78.4	21.6	15-30
0.6	624	9251	84.1	15.9	8-22
0.075	1339	10590	96.3	3.7	0-5

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID : CP-RW-2018-12-31-139

Project Name : Package no.3 (Package Consists of 21 Works) **Date: 04-02-19**

Name Of Work : Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 01-02-19

Type of Mix : Coarse Aggregate for WMM (Wet Mix Macadam)

Date of test : 01-02-19

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.8	225.9
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.5	0.3
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Date: 04-02-19

Lab ID	:	**CP-RW-2018-12-31-139**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name Of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	01-02-19
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	01-02-19

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.9%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.0%	
Combined Flakiness and Elongation Index for WMM	24.9%	

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TEST RESULTS OF GRADATION FOR WMM

Lab ID : **CP-RW-2018-12-31-139** **Date: 05-01-19**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Telecom Layout, Ganeshnagara and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 02-01-19

Type of Mix : WMM (Wet Mix Macadam)

Date of test : 02-01-19

Oven Dry Weight : 11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	315	315	2.9	97.1	95-100
22.4	2254	2569	23.4	76.6	60-80
11.2	2179	4748	43.2	56.8	40-60
4.75	2251	6999	63.6	36.4	25-40
2.36	1624	8623	78.4	21.6	15-30
0.6	623	9246	84.1	15.9	8-22
0.075	1336	10582	96.2	3.8	0-5

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TEST RESULTS OF GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID : CP-RW-2018-12-31-139 **Date: 13-02-19**

Project Name : Package no.3 (Package Consists of 21 Works)

Name Of Work : Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 11-02-19

Sample ID No : 2018-01-03-01/01

Type of Mix : BM-Plant (Bituminous Macadam)

Date of test : 11-02-19

Weight of Sample(gm) : 5000

IS Sieve Size(mm)	Weight Retained(gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0	100	100
19	166	166	3.3	96.7	90-100
13.2	513	679	13.6	86.4	56-88
4.75	2758	3437	68.7	31.3	16-36
2.36	912	4349	87.0	13.0	4-19
0.3	358	4707	94.1	5.9	2-10
0.075	233	4940	98.8	1.2	0-8
PAN	60	5000	100.0	0.0	0

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS MACADAM

Date: 14-02-19

Lab ID	:	**CP-RW-2018-12-31-139**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name Of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	11-02-19
Sample ID No	:	2018-01-03-01/01
Type of Mix	:	BM (Bituminous Macadam)
Date of test	:	11-02-19

Table 500-6 : Physical Requirements fo Coarse Aggregate for Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	13.8	Combined Flakiness & Elongation Index for BM is Maximum 35%	IS:2386 Part I
	Elongation Index	7.2		
Strength	Aggregate Impact Value	25.2	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.51	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.17	Maximum 2%	IS:2386 Part III

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	CP-RW-2018-12-31-139	**Date: 14-02-19**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	11-02-19	
Type of Mix	:	BM(Bitumnous Macadam)	
Date of test	:	11-02-19	

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 14-02-19**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Project Name	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	11-02-19	
Type of Mix	:	BM (Bituminous Mecadam)	
Date of test	:	11-02-19	

The results of the tests conducted on the Bituminous Macadam mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.29	11.82	9KN(Min)
2	Marshal flow at 60°C, mm	3.54	3.87	2-4
3	Percent air Voids	4.56	4.17	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.54	14.76	13-15
5	Percent Voids filled with Bitumen(VFB %)	68.98	70.28	65-75
6	Density, g/cc	2.42	2.40	–

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 23-02-19**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	22-02-19	
Type of Mix	:	BM (Bituminous Macadam)	
Date of test	:	22-02-19	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	479	478
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.2	4.4
4	Average percentage	%	4.3	

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Lab ID : CP-RW-2018-12-31-139 Date: 23-02-19

AFTER EXTRACTION(Trail-1)

Weight of Sample : 479 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	38	38	7.9	92.1	90-100
13.2	147	185	38.6	61.4	56-88
4.75	191	376	78.5	21.5	16-36
2.36	28	404	84.3	15.7	4-19
0.3	32	436	91.0	9.0	2-10
0.075	31	467	97.5	2.5	0-8

AFTER EXTRACTION(Trail-2)

Weight of Sample : 478 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	38	38	7.9	92.1	90-100
13.2	147	185	38.7	61.3	56-88
4.75	191	376	78.7	21.3	16-36
2.36	28	404	84.5	15.5	4-19
0.3	32	436	91.2	8.8	2-10
0.075	31	467	97.7	2.3	0-8

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	CP-RW-2018-12-31-139 **Date: 20-02-19**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	18-02-19
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of test	:	18-02-19
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	98	98	2.0	98.0	90-100
9.5	719	817	16.3	83.7	70-88
4.75	865	1682	33.6	66.4	53-71
2.36	586	2268	45.4	54.6	42-58
1.18	491	2759	55.2	44.8	34-48
0.6	502	3261	65.2	34.8	26-38
0.3	528	3789	75.8	24.2	18-28
0.15	467	4256	85.1	14.9	12-20
0.075	348	4604	92.1	7.9	4-10
PAN	396	5000	100	0.0	0

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 20-02-19**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	18-02-19	
Type of Mix	:	BC(Bitumenous Concrete)	
Date of test	:	18-02-19	

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	CP-RW-2018-12-31-139	Date: 20-02-19
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	18-02-19	
Type of Mix	:	BC (Bituminous Concrete)	
Date of test	:	18-02-19	

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.5	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.9		
Strength	Aggregate Impact Value	22.2	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.68	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.25	Maximum 2%	IS:2386 Part III

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2018-12-31-139** **Date: 20-02-19**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	18-02-19
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	18-02-19

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.12	11.14	10KN(min)
2	Marshal flow at 60°C, mm	3.51	3.5	2-4
3	Percent air Voids	4.82	4.83	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.28	14.26	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.87	71.63	65-75
6	Density, g/cc	2.25	2.26	–

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID : CP-RW-2018-12-31-139 **Date: 28-02-19**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 26-02-19

Type of Mix : BC (Bituminous Concrete)

Date of test : 26-02-19

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	472	473
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.6	5.4
4	Average percentage	%	5.5	

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Lab ID : CP-RW-2018-12-31-139 Date: 28-02-19

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 472

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.7	62.3	53-71
2.36	88	266	56.4	43.6	42-58
1.18	29	295	62.5	37.5	34-48
0.6	11	306	64.8	35.2	26-38
0.3	46	352	74.6	25.4	18-28
0.15	45	397	84.1	15.9	12-20
0.075	55	452	95.8	4.2	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	68	72	15.2	84.8	70-88
4.75	112	184	38.9	61.1	53-71
2.36	88	272	57.5	42.5	42-58
1.18	30	302	63.8	36.2	34-48
0.6	11	313	66.2	33.8	26-38
0.3	46	359	75.9	24.1	18-28
0.15	45	404	85.4	14.6	12-20
0.075	55	459	97.0	3.0	4-10

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TEST REPORT ON BITUMEN

Date: 08-02-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandumagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer's Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	07-02-18
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-1220(1978) (Reaffirmed-2004)
Date of test	:	07-02-18

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	64	60 to 70
2	Softening Point, °C	51.4	Min. 40°C
3	Ductility, cm	95	Min. 75cm
4	Flash point, °C	248	Min. 220°C
	Fire point, °C	272	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : CP-RW-2018-12-31-139 **Date: 27-02-19**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Krishna Temple area, Deshabandunagara, Chikkavenkatappa Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 26-02-19

Type of Mix : Tack coat

Date of test : 26-02-19

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.75	0.745
4	Final weight of plate after application of tack Coat (c)	Kg	0.773	0.768
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 17-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	15-11-18	
Type of Mix	:	BC (Bituminous Concrete)	
Date of test	:	15-11-18	

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.12	11.13	10KN(min)
2	Marshal flow at 60°C, mm	3.52	3.51	2-4
3	Percent air Voids	4.82	4.83	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.28	14.26	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.87	71.63	65-75
6	Density, g/cc	2.25	2.26	–

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 17-11-18**
Project Name		Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	15-11-18	
Type of Mix	:	BC (Bituminous Concrete)	
Date of test	:	15-11-18	

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.8	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.6		
Strength	Aggregate Impact Value	22.3	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.67	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.22	Maximum 2%	IS:2386 Part III

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Date: 17-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	15-11-18
Type of Mix	:	BC(Bitumenous Concrete)
Date of test	:	15-11-18

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

Note:-
The results pertain to the samples received and tested.
All information Furnished by Customer/ Representative
Any correction in the report will make this report invalid.
This report without prior written approval should not be reproduced or published in full or part.
Samples will be disposed after 90 days from the date of issue of test certificate

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 17-11-18**
Project Name		Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	15-11-18	
Type of Mix	:	BC-Plant (Bituminous Concrete)	
Date of test	:	15-11-18	
Oven Dry Weight	:	5000	Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	89	89	1.8	98.2	90-100
9.5	706	795	15.9	84.1	70-88
4.75	891	1686	33.7	66.3	53-71
2.36	587	2273	45.5	54.5	42-58
1.18	492	2765	55.3	44.7	34-48
0.6	503	3268	65.4	34.6	26-38
0.3	528	3796	75.9	24.1	18-28
0.15	458	4254	85.1	14.9	12-20
0.075	350	4604	92.1	7.9	4-10
PAN	396	5000	100	0.0	0

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	CP-RW-2018-12-31-139	**Date: 22-11-18**
Project Name		Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #IC-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BVP/WO/148/2018-19	
Date of Receipt	:	20-11-18	
Type of Mix	:	BM (Bituminous Macadam)	
Date of test	:	20-11-18	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	479	478
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.3	4.5
4	Average percentage	%	4.4	

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Lab ID : CP-RW-2018-12-31-139 **Date: 22-11-18**

AFTER EXTRACTION(Trail-1)

Weight of Sample : 479 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	38	38	7.9	92.1	90-100
13.2	147	185	38.7	61.3	56-88
4.75	189	374	78.2	21.8	16-36
2.36	28	402	84.0	16.0	4-19
0.3	32	434	90.7	9.3	2-10
0.075	21	455	95.1	4.9	0-8

AFTER EXTRACTION(Trail-2)

Weight of Sample : 478 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	38	38	8.0	92.0	90-100
13.2	143	181	37.9	62.1	56-88
4.75	191	372	77.9	22.1	16-36
2.36	27	399	83.6	16.4	4-19
0.3	32	431	90.3	9.7	2-10
0.075	28	459	96.1	3.9	0-8

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID : CP-RW-2018-12-31-139 **Date: 20-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division

Agency : Sri.C G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 19-11-18

Type of Mix : BM (Bituminous Macadam)

Date of test : 19-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	479	478
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.2	4.4
4	Average percentage	%	4.3	

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Lab ID : CP-RW-2018-12-31-139

Date: 20-11-18

AFTER EXTRACTION(Trail-1)

Weight of Sample : 479 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	38	38	7.9	92.1	90-100
13.2	147	185	38.6	61.4	56-88
4.75	189	374	78.1	21.9	16-36
2.36	28	402	83.9	16.1	4-19
0.3	32	434	90.6	9.4	2-10
0.075	21	455	95.0	5.0	0-8

AFTER EXTRACTION(Trail-2)

Weight of Sample : 478 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0.0	100.0	100
19	38	38	7.9	92.1	90-100
13.2	143	181	37.9	62.1	56-88
4.75	191	372	77.8	22.2	16-36
2.36	27	399	83.5	16.5	4-19
0.3	32	431	90.2	9.8	2-10
0.075	28	459	96.0	4.0	0-8

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TESTS RESULTS ON STABILITY OF MIX

Lab ID : **CP-RW-2018-12-31-139** **Date: 14-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 12-11-18

Type of Mix : BM (Bituminous Mecadam)

Date of test : 12-11-18

The results of the tests conducted on the Bituminous Macadam mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.39	11.82	9KN(Min)
2	Marshal flow at 60°C, mm	3.54	3.87	2-4
3	Percent air Voids	4.56	4.17	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.54	14.76	13-15
5	Percent Voids filled with Bitumen(VFB %)	68.98	70.28	65-75
6	Density, g/cc	2.42	2.40	–

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Date: 14-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	12-11-18
Type of Mix	:	BM(Bitumnous Macadam)
Date of test	:	12-11-18
Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.5	1.5	98.3	Minimum Retained Coating 95%
2	98.0	2.0		
3	98.5	1.5		

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS MACADAM

Lab ID	:	**CP-RW-2018-12-31-139** **Date: 14-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	12-11-18
Type of Mix	:	BM (Bituminous Macadam)
Date of test	:	12-11-18

Table 500-6 : Physical Requirements fo Coarse Aggregate for Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	13.8	Combined Flakiness & Elongation Index for BM is Maximum 35%	IS:2386 Part I
	Elongation Index	7.8		
Strength	Aggregate Impact Value	25.3	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.51	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.17	Maximum 2%	IS:2386 Part III

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS MACADAM

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 14-11-18**
Project Name		Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	12-11-18	
Type of Mix	:	BM (Bituminous Macadam)	
Date of test	:	12-11-18	

Table 500-6 : Physical Requirements fo Coarse Aggregate for Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	13.8	Combined Flakiness & Elongation Index for BM is Maximum 35%	IS:2386 Part I
	Elongation Index	7.8		
Strength	Aggregate Impact Value	25.3	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.51	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.17	Maximum 2%	IS:2386 Part III

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TEST RESULTS OF GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Date: 14-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Sample Condition	:	Satisfactory
Date of Receipt	:	12-11-18
Type of Mix	:	BM-Plant (Bituminous Macadam)
Date of test		12-11-18
Weight of Sample(gm)	:	5000

IS Sieve Size(mm)	Weight Retained(gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0	100	100
19	175	175	3.5	96.5	90-100
13.2	502	677	13.5	86.5	56-88
4.75	2759	3436	68.7	31.3	16-36
2.36	911	4347	86.9	13.1	4-19
0.3	358	4705	94.1	5.9	2-10
0.075	232	4937	98.7	1.3	0-8
PAN	63	5000	100.0	0.0	0

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	CP-RW-2018-12-31-139	**Date: 02-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	30-10-18	
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)	
Date of test	:	30-10-18	

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.9%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.6%	
Combined Flakiness and Elongation Index for WMM	25.5%	

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Date: 02-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	30-10-18
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	30-10-18

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.8	225.7
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.5	0.5
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

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TEST RESULTS OF GRADATION FOR WMM

Date: 02-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name		Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	30-10-18
Type of Mix	:	WMM (Wet Mix Macadam)
Date of test	:	30-10-18
Oven Dry Weight	:	11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	417	417	3.8	96.2	95-100
22.4	2259	2676	24.3	75.7	60-80
11.2	2191	4867	44.2	55.8	40-60
4.75	2351	7218	65.6	34.4	25-40
2.36	1721	8939	81.3	18.7	15-30
0.6	723	9662	87.8	12.2	8-22
0.075	1338	11000	100.0	0.0	0-5

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TEST RESULTS OF GRADATION FOR WMM

Date: 02-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name		Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	30-10-18
Type of Mix	:	WMM (Wet Mix Macadam)
Date of test	:	30-10-18
Oven Dry Weight	:	11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	417	417	3.8	96.2	95-100
22.4	2259	2676	24.3	75.7	60-80
11.2	2191	4867	44.2	55.8	40-60
4.75	2351	7218	65.6	34.4	25-40
2.36	1721	8939	81.3	18.7	15-30
0.6	723	9662	87.8	12.2	8-22
0.075	1338	11000	100.0	0.0	0-5

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID	:	CP-RW-2018-12-31-139	Date: 26-11-18
Project Name		Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	23-11-18	
Type of Mix	:	BC (Bituminous Concrete)	
Date of test	:	23-11-18	

Slno	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	472	471
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.6	5.8
4	Average percentage	%	5.7	

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Lab ID : CP-RW-2018-12-31-139 Date: 26-11-18

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 472

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.7	62.3	53-71
2.36	88	266	56.4	43.6	42-58
1.18	29	295	62.5	37.5	34-48
0.6	11	306	64.8	35.2	26-38
0.3	46	352	74.6	25.4	18-28
0.15	45	397	84.1	15.9	12-20
0.075	55	452	95.8	4.2	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.8	62.2	53-71
2.36	88	266	56.5	43.5	42-58
1.18	29	295	62.6	37.4	34-48
0.6	11	306	65.0	35.0	26-38
0.3	46	352	74.7	25.3	18-28
0.15	45	397	84.3	15.7	12-20
0.075	55	452	96.0	4.0	4-10

Note:-
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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID : CP-RW-2018-12-31-139 **Date: 27-11-18**

Project Name Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 24-11-18

Type of Mix : BC (Bituminous Concrete)

Date of test : 24-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	473	472
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.4	5.6
4	Average percentage	%	5.5	

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Date: 27-11-18

Lab ID : CP-RW-2018-12-31-139

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.2	43.8	42-58
1.18	29	295	62.4	37.6	34-48
0.6	11	306	64.7	35.3	26-38
0.3	46	352	74.4	25.6	18-28
0.15	45	397	83.9	16.1	12-20
0.075	55	452	95.6	4.4	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 472

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.7	62.3	53-71
2.36	88	266	56.4	43.6	42-58
1.18	29	295	62.5	37.5	34-48
0.6	11	306	64.8	35.2	26-38
0.3	46	352	74.6	25.4	18-28
0.15	45	397	84.1	15.9	12-20
0.075	55	452	95.8	4.2	4-10

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Date: 28-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name		Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	26-11-18
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	26-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	471	470
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.8	6.0
4	Average percentage	%	5.9	

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Lab ID : CP-RW-2018-12-31-139 Date: 28-11-18

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.8	62.2	53-71
2.36	88	266	56.5	43.5	42-58
1.18	29	295	62.6	37.4	34-48
0.6	11	306	65.0	35.0	26-38
0.3	46	352	74.7	25.3	18-28
0.15	45	397	84.3	15.7	12-20
0.075	55	452	96.0	4.0	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 470

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.9	99.1	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.9	62.1	53-71
2.36	88	266	56.6	43.4	42-58
1.18	29	295	62.8	37.2	34-48
0.6	11	306	65.1	34.9	26-38
0.3	46	352	74.9	25.1	18-28
0.15	45	397	84.5	15.5	12-20
0.075	50	447	95.1	4.9	4-10

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Format No: CP/TF/01

TEST REPORT ON BITUMEN

Date: 10-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer's Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	09-11-18
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-1220(1978) (Reaffirmed-2004)
Date of test	:	09-11-18

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	65	60 to 70
2	Softening Point, °C	51.6	Min. 40°C
3	Ductility, cm	97	Min. 75cm
4	Flash point, °C	244	Min. 220°C
	Fire point, °C	272	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Date: 24-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer's Reference	:	BBMP/EE/BTP/WO/148/2018-19
Sample Condition	:	Satisfactory
Date of Receipt	:	23-11-18
Type of Mix	:	Tack coat
Date of test	:	23-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.76	0.758
4	Final weight of plate after application of tack Coat (c)	Kg	0.783	0.781
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Date: 26-11-18

Lab ID : CP-RW-2018-12-31-139

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 24-11-18

Type of Mix : Tack coat

Date of test : 24-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.78	0.768
4	Final weight of plate after application of tack Coat (c)	Kg	0.803	0.791
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Date: 27-11-18

Lab ID : CP-RW-2018-12-31-139

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Thindlu and Surrounding area in Ward No. 09 Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 26-11-18

Type of Mix : Tack coat

Date of test : 26-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.79	0.756
4	Final weight of plate after application of tack Coat (c)	Kg	0.813	0.779
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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TEST RESULTS OF GRADATION FOR WMM

Lab ID	:	CP-RW-2018-12-31-139 **Date: 29-10-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work		Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa,#1C-301,3rd Main Block,HRBR Layout,Kalyan Nagar Bangalore-560043
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	26-10-18
Type of Mix	:	WMM (Wet Mix Macadam)
Date of test	:	26-10-18
Oven Dry Weight	:	11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	312	312	2.8	97.2	95-100
22.4	2262	2574	23.4	76.6	60-80
11.2	2182	4756	43.2	56.8	40-60
4.75	2248	7004	63.7	36.3	25-40
2.36	1627	8631	78.5	21.5	15-30
0.6	639	9270	84.3	15.7	8-22
0.075	1338	10608	96.4	3.6	0-5

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 29-10-18**
Project Name		Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	26-10-18	
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)	
Date of test	:	26-10-18	

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	303.2	303.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	62.8	64.1
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	240.1	238.6
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.3	0.5
5	Aggregate impact value	(B/A)*100	20.7	21.1
6	Aggregate impact value (Mean of two tests)	Pecentage	20.9	

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Date: 29-10-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name		Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	26-10-18
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	26-10-18

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	303.2	303.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	62.8	64.1
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	240.1	238.6
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.3	0.5
5	Aggregate impact value	(B/A)*100	20.7	21.1
6	Aggregate impact value (Mean of two tests)	Pecentage	20.9	

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Date: 29-10-18

Lab ID	:	**CP-RW-2018-12-31-139**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa,#1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	26-10-18
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	26-10-18

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	11.9%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.2%	
Combined Flakiness and Elongation Index for WMM	24.1%	

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Date: 10-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	07-11-18
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of test	:	07-11-18
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	89	89	1.8	98.2	90-100
9.5	702	791	15.8	84.2	70-88
4.75	895	1686	33.7	66.3	53-71
2.36	587	2273	45.5	54.5	42-58
1.18	492	2765	55.3	44.7	34-48
0.6	503	3268	65.4	34.6	26-38
0.3	528	3796	75.9	24.1	18-28
0.15	458	4254	85.1	14.9	12-20
0.075	350	4604	92.1	7.9	4-10
PAN	396	5000	100	0.0	0

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	CP-RW-2018-12-31-139 **Date: 10-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	07-11-18
Type of Mix	:	BC(Bitumenous Concrete)
Date of test	:	07-11-18

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.5	1.5	98.3	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	CP-RW-2018-12-31-139 **Date: 10-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	07-11-18
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	07-11-18

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.6	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.8		
Strength	Aggregate Impact Value	22.7	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.68	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.21	Maximum 2%	IS:2386 Part III

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TEST RESULTS OF GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Date: 05-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa,#1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar, Bangalore-560043
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	03-11-18
Type of Mix	:	BM-Plant (Bituminous Macadam)
Date of test		03-11-18
Weight of Sample(gm)	:	5000

IS Sieve Size(mm)	Weight Retained(gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-7(grading -2)
26.5	0	0	0	100	100
19	162	162	3.2	96.8	90-100
13.2	510	672	13.4	86.6	56-88
4.75	2750	3422	68.4	31.6	16-36
2.36	910	4332	86.6	13.4	4-19
0.3	355	4687	93.7	6.3	2-10
0.075	230	4917	98.3	1.7	0-8
PAN	83	5000	100.0	0.0	0

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS MACADAM

Lab ID : **CP-RW-2018-12-31-139** **Date: 05-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Virupakshapura and surroundi Ward no.09, Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa,#1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar, Bangalore-560043

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 03-11-18

Type of Mix : BM (Bituminous Macadam)

Date of test : 03-11-18

Table 500-6 : Physical Requirements fo Coarse Aggregate for Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	11.8	Combined Flakiness & Elongation Index for BM is Maximum 35%	IS:2386 Part I
	Elongation Index	10.4		
Strength	Aggregate Impact Value	22.7	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.66	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.19	Maximum 2%	IS:2386 Part III

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	CP-RW-2018-12-31-139	**Date: 05-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	03-11-18	
Type of Mix	:	BC (Bituminous Concrete)	
Date of test	:	03-11-18	

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.14	11.03	10KN(min)
2	Marshal flow at 60°C, mm	3.72	3.51	2-4
3	Percent air Voids	4.52	4.33	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.48	14.36	13-15
5	Percent Voids filled with Bitumen(VFB %)	72.87	72.63	65-75
6	Density, g/cc	2.25	2.26	–

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID : CP-RW-2018-12-31-139 **Date: 16-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 15-11-18

Type of Mix : BC (Bituminous Concrete)

Date of test : 15-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	473	472
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.4	5.6
4	Average percentage	%	5.5	

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Lab ID : CP-RW-2018-12-31-139 Date: 16-11-18

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.2	43.8	42-58
1.18	29	295	62.4	37.6	34-48
0.6	11	306	64.7	35.3	26-38
0.3	46	352	74.4	25.6	18-28
0.15	45	397	83.9	16.1	12-20
0.075	55	452	95.6	4.4	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 472

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.7	62.3	53-71
2.36	88	266	56.4	43.6	42-58
1.18	29	295	62.5	37.5	34-48
0.6	11	306	64.8	35.2	26-38
0.3	46	352	74.6	25.4	18-28
0.15	45	397	84.1	15.9	12-20
0.075	55	452	95.8	4.2	4-10

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TEST RESULTS OF GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Date: 14-11-18

Lab ID	:	CP-RW-2018-01-22-01
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division
Agency	:	Sri.C.G.Chandrappa,#1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar, Bangalore-560043
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19
Source of Sample	:	Sample supplied by Agency
Date of Receipt	:	13-11-18
Type of Mix	:	BM (Bituminous Macadam)
Date of test	:	13-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	478	479
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.4	4.2
4	Average percentage	%	4.3	

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TEST RESULTS OF GRADATION FOR BM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID : CP-RW-2018-01-22-01 **Date: 14-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa,#1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar, Bangalore-560043

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Source of Sample : Sample supplied by Agency

Date of Receipt : 13-11-18

Type of Mix : BM (Bituminous Macadam)

Date of test : 13-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	478	479
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.4	4.2
4	Average percentage	%	4.3	

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Format No: CP/TF/01

TEST REPORT ON BITUMEN

Lab ID : **CP-2018-09-17-07** **Date: 02-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Customer's Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 02-11-18

Sample Type : Bitumen

Reference to BIS codes : IS: 1201-1220(1978) (Reaffirmed-2004)

Date of test : 02-11-18

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	64	60 to 70
2	Softening Point, °C	51.2	Min. 40°C
3	Ductility, cm	98	Min. 75cm
4	Flash point, °C	246	Min. 220°C
	Fire point, °C	272	

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID	:	CP-RW-2018-12-31-139	**Date: 19-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division	
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2018-19	
Date of Receipt	:	17-11-18	
Type of Mix	:	BC (Bituminous Concrete)	
Date of test	:	17-11-18	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	473	474
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.4	5.2
4	Average percentage	%	5.3	

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Lab ID : CP-RW-2018-12-31-139 **Date: 19-11-18**

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.2	43.8	42-58
1.18	29	295	62.4	37.6	34-48
0.6	11	306	64.7	35.3	26-38
0.3	46	352	74.4	25.6	18-28
0.15	45	397	83.9	16.1	12-20
0.075	55	452	95.6	4.4	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 474

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	13.9	86.1	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.1	43.9	42-58
1.18	29	295	62.2	37.8	34-48
0.6	11	306	64.6	35.4	26-38
0.3	46	352	74.3	25.7	18-28
0.15	45	397	83.8	16.2	12-20
0.075	50	447	94.3	5.7	4-10

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : CP-RW-2018-12-31-139 **Date: 16-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 15-11-18

Type of Mix : Tack coat

Date of test : 15-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.77	0.748
4	Final weight of plate after application of tack Coat (c)	Kg	0.793	0.771
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Date: 17-11-18

Lab ID : CP-RW-2018-12-31-139

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 16-11-18

Type of Mix : Tack coat

Date of test : 16-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.775	0.749
4	Final weight of plate after application of tack Coat (c)	Kg	0.798	0.772
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : CP-RW-2018-12-31-139 **Date: 19-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Virupakshapura and surrounding area in Ward no.09, Vidyaranyapura Sub Division

Customer Reference : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 17-11-18

Type of Mix : Tack coat

Date of test : 17-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.76	0.752
4	Final weight of plate after application of tack Coat (c)	Kg	0.783	0.775
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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TEST RESULTS OF GRADATION FOR WMM

Date: 15-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	12-11-18
Type of Mix	:	WMM (Wet Mix Macadam)
Date of test	:	12-11-18
Oven Dry Weight	:	11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	315	315	2.9	97.1	95-100
22.4	2259	2574	23.4	76.6	60-80
11.2	2179	4753	43.2	56.8	40-60
4.75	2251	7004	63.7	36.3	25-40
2.36	1621	8625	78.4	21.6	15-30
0.6	623	9248	84.1	15.9	8-22
0.075	1338	10586	96.2	3.8	0-5

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Date: 15-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	12-11-18
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	12-11-18

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.9	225.8
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.4	0.4
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2018-12-31-139**	**Date: 15-11-18**
Project Name	:	Package no.3 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19	
Date of Receipt	:	12-11-18	
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)	
Date of test	:	12-11-18	

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	CP-RW-2018-12-31-139	Date: 24-11-18
Project Name	:	Package No.03 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19	
Date of Receipt	:	22-11-18	
Type of Mix	:	BC-Plant (Bituminous Concrete)	
Date of test	:	22-11-18	
Oven Dry Weight	:	5000	Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	89	89	1.8	98.2	90-100
9.5	702	791	15.8	84.2	70-88
4.75	895	1686	33.7	66.3	53-71
2.36	587	2273	45.5	54.5	42-58
1.18	492	2765	55.3	44.7	34-48
0.6	503	3268	65.4	34.6	26-38
0.3	528	3796	75.9	24.1	18-28
0.15	458	4254	85.1	14.9	12-20
0.075	350	4604	92.1	7.9	4-10
PAN	396	5000	100	0.0	0

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Date: 24-11-18

Lab ID	:	**CP-RW-2018-12-31-139**
Project Name	:	Package No.03 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	22-11-18
Type of Mix	:	BC(Bitumenous Concrete)
Date of test	:	22-11-18

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.5	1.5	98.3	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Date: 24-11-18

Lab ID	:	**CP-RW-2018-12-31-139**
Project Name	:	Package No.03 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	22-11-18
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	22-11-18

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.4	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.8		
Strength	Aggregate Impact Value	22.1	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.68	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.21	Maximum 2%	IS:2386 Part III

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	CP-RW-2018-12-31-139	**Date: 24-11-18**
Project Name	:	Package No.03 (Package Consists of 21 Works)	
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.	
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.	
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19	
Date of Receipt	:	22-11-18	
Type of Mix	:	BC (Bituminous Concrete)	
Date of test	:	22-11-18	

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.14	11.13	10KN(min)
2	Marshal flow at 60°C, mm	3.52	3.51	2-4
3	Percent air Voids	4.82	4.83	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.28	14.26	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.87	71.63	65-75
6	Density, g/cc	2.25	2.26	–

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Date: 28-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package No.03 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	26-11-18
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	26-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	472	473
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.6	5.4
4	Average percentage	%	5.5	

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Lab ID : CP-RW-2018-12-31-139 **Date: 28-11-18**

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 472

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.7	62.3	53-71
2.36	88	266	56.4	43.6	42-58
1.18	29	295	62.5	37.5	34-48
0.6	11	306	64.8	35.2	26-38
0.3	46	352	74.6	25.4	18-28
0.15	45	397	84.1	15.9	12-20
0.075	55	452	95.8	4.2	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.2	43.8	42-58
1.18	29	295	62.4	37.6	34-48
0.6	11	306	64.7	35.3	26-38
0.3	46	352	74.4	25.6	18-28
0.15	45	397	83.9	16.1	12-20
0.075	55	452	95.6	4.4	4-10

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TEST REPORT ON BITUMEN

Date: 20-11-18

Lab ID	:	**CP-RW-2018-12-31-139**
Project Name	:	Package No.03 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer's Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	19-11-18
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-1220(1978) (Reaffirmed-2004)
Date of test	:	19-11-18

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	68	60 to 70
2	Softening Point, °C	51.6	Min. 40°C
3	Ductility, cm	96	Min. 75cm
4	Flash point, °C	246	Min. 220°C
	Fire point, °C	274	

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Date: 29-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package No.03 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	27-11-18
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	27-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	474	473
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.20	5.40
4	Average percentage	%	5.3	

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Lab ID : CP-RW-2018-12-31-139 Date: 29-11-18

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 474

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	13.9	86.1	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.1	43.9	42-58
1.18	29	295	62.2	37.8	34-48
0.6	11	306	64.6	35.4	26-38
0.3	46	352	74.3	25.7	18-28
0.15	45	397	83.8	16.2	12-20
0.075	55	452	95.4	4.6	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.2	43.8	42-58
1.18	29	295	62.4	37.6	34-48
0.6	11	306	64.7	35.3	26-38
0.3	46	352	74.4	25.6	18-28
0.15	45	397	83.9	16.1	12-20
0.075	55	452	95.6	4.4	4-10

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Date: 30-11-18

Lab ID	:	CP-RW-2018-12-31-139
Project Name	:	Package No.03 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore-560043.
Customer Reference	:	BBMP/EE/BTP/WO/148/2019-19
Date of Receipt	:	28-11-18
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	28-11-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	470	471
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	6.00	5.80
4	Average percentage	%	5.9	

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Lab ID : CP-RW-2018-12-31-139 Date: 30-11-18

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 470

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.9	99.1	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.9	62.1	53-71
2.36	88	266	56.6	43.4	42-58
1.18	29	295	62.8	37.2	34-48
0.6	11	306	65.1	34.9	26-38
0.3	46	352	74.9	25.1	18-28
0.15	45	397	84.5	15.5	12-20
0.075	55	452	96.2	3.8	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.8	62.2	53-71
2.36	88	266	56.5	43.5	42-58
1.18	29	295	62.6	37.4	34-48
0.6	11	306	65.0	35.0	26-38
0.3	46	352	74.7	25.3	18-28
0.15	45	397	84.3	15.7	12-20
0.075	55	452	96.0	4.0	4-10

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : CP-RW-2018-12-31-139 **Date: 27-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.

Work Order Ref BBMP/EE/BTP/WO/148/2019-19

Date of Receipt : 26-11-18

Type of Mix : Tack coat

Date of test : 26-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.72	0.76
4	Final weight of plate after application of tack Coat (c)	Kg	0.743	0.783
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : CP-RW-2018-12-31-139 **Date: 28-11-18**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.

Work Order Ref : BBMP/EE/BTP/WO/148/2019-19

Date of Receipt : 27-11-18

Type of Mix : Tack coat

Date of test : 27-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.74	0.79
4	Final weight of plate after application of tack Coat (c)	Kg	0.763	0.813
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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DETERMINATION OF RATE OF SPREAD TACK COAT

Date: 29-11-18

Lab ID : CP-RW-2018-12-31-139

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at Sir MV Layout, Siddivinayaka, Anand Layout and Surrounding Areas in Ward no.09 Vidyaranyapura Sub Division.

Work Order Ref : BBMP/EE/BTP/WO/148/2019-19

Date of Receipt : 28-11-18

Type of Mix : Tack coat

Date of test : 28-11-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.77	0.79
4	Final weight of plate after application of tack Coat (c)	Kg	0.793	0.813
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	CP-2018-12-31-139 **Date: 25-01-2019**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan
Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	22-01-2019
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 (Part 1,2 3,4,5, 6,11):1988 IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4 IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5 IS 4031 Part 3, Determination of Soundness, Clause 5,Clause 6 IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5 IS 4031 Part 11,DETERMINATION OF DENSITY , Clause 6
Date of test	:	23-01-2019
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	Fineness by dry sieving (%)	1.79	–
2	Finess by Air permeablity method (m^2/kg,Min)	267.9	225m^2/kg, Min
3	Density (gm/cc)	3.22	–
4	Standard Consistency (%)	29.0%	Not specified
5	Initial Setting time	185 minutes	Not less than 30 minutes
6	Final Setting time	250 minutes	Not more than 600 minutes
7	Soundness (Le Chatelier's Method)	1.5mm	Not more than 10 mm

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TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Date: 20-02-2019

Lab ID	:	CP-2018-12-31-139
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	22-01-2019
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 6, Determination of Compressive Strength, Clause 6
Date of test	:	23-01-2019
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Compressive Strength

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	3 Days	29.0N/mm^2	Not less than 27 N/mm^2
2	7 Days	39.0N/mm^2	Not less than 37 N/mm^2
3	28 Days	59.5N/mm^2	Not less than 53 N/mm^2

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2018-12-31-139** **Date: 25-01-2019**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	22-01-2019
Sample Type	:	40mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	22-01-2019

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:

Total weight taken : 15000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	80 mm	0	0	0.0	100	100
2	40 mm	315	315	2.1	97.9	90-100
3	20 mm	6985	7300	48.7	51.3	30-70
4	10 mm	4988	12288	81.9	18.1	10-35
5	4.75 mm	2245	14533	96.9	3.1	0-5
6	Pan	467	15000	100.0	0	---

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2018-12-31-139** **Date: 25-01-2019**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	10.8	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.6	
3	Specific Gravity	2.63	–
4	Bulk Density(Loose) (Kg/l)	1.43	–
5	Bulk Density(Compacted) (Kg/l)	1.47	–
6	Water Absorption(%)	0.21	–

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2018-12-31-139** **Date: 24-01-2019**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	22-01-2019
Sample Type/ Size	:	20mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	22-01-2019

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:

Total weight taken : 5000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	40 mm	0	0	0	100	100
2	20 mm	465	465	9.3	90.7	90-100
3	10 mm	2935	3400	68.0	32.0	25-55
4	4.75 mm	1236	4636	92.7	7.3	0-10
5	Pan	364	5000	100	0	–

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2018-12-31-139** **Date: 24-01-2019**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	10.9	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.2	
3	Specific Gravity	2.65	–
4	Bulk Density(Loose) (Kg/l)	1.52	–
5	Bulk Density(Compacted) (Kg/l)	1.56	–
6	Water Absorption(%)	0.25	–
7	Aggregate crushing Value(%)	25.1	Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface.
8	Aggregate Impact Value(%)	23.9	30% for Aggregates to be used in concrete for wearing Surface, 45% for Aggregates to be used in concrete other than for wearing Surface.

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Authorized Signature
Quality Manager

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2018-12-31-139** **Date: 24-01-2019**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 22-01-2019

Sample Type : Fine Aggregate

Reference to BIS codes : IS 383 : 2016 (Specification for Coarse and fine Aggregates)
IS: 2386 :1963(Part - 1, 3) RA2012
IS 2386 Part 1: Particle Size and Shape
IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption

Date of test : 22-01-2019

Total weight taken : 1000 grams

Sl.no	Sieve Size	Weight Retained (gms)	Cumulative Weight Retained (gms)	% Cumulative Weight Retained	% Passing	Requirement as per IS 383:2016			
						Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
1	10 mm	0	0	0.0	100.0	100	100	100	100
2	4.75 mm	27	27	2.7	97.3	90-100	90-100	90-100	95-100
3	2.36 mm	55	82	8.2	91.8	60-95	75-100	85-100	95-100
4	1.18 mm	239	321	32.1	67.9	30-70	55-90	75-100	90-100
5	600 micron	205	526	52.6	47.4	15-34	35-59	60-79	80-100
6	300 micron	203	729	72.9	27.1	5-20	8-30	12-40	15-50
7	150 micron	191	920	92.0	8.0	0-10	0-10	0-10	0-15
8	Pan	80	1000	100.0	0.0	---	---	---	---

Result :The tested Sample Conforms to Grading Zone II

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2018-12-31-139** **Date: 24-01-2019**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS 383:2016
1	Water Absorption(%)	1.5	–
2	Specific Gravity	2.59	–
3	Material finer than 75 micron(%)	6.9	Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10%

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-12-31-139** **Date: 04/02/2019**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 30-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 04/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	150.97 X 149.37 X 151.89	22551	8.327	583.7	25.9	25.4
2	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	150.36 X 149.35 X 150.54	22456	8.125	586.0	26.1	
3	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	149.82 X 149.27 X 151.75	22364	8.246	539.0	24.1	

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TEST REPORT OF CEMENT CONCRETE CUBES

Format No: CP/TF/01

Lab ID : CP-2018-12-31-139

Date: 25/02/2019

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 30-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 25/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen	Cross sectional area	Weight of the sample	Failure Load	Compressive strength	Average Compressive Strength
					(mm)	(Sq.mm)	(kg)	(KN)	(N/mm^2)	(N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	149.16 X 149.46 X 150.77	22293	8.323	755.3	33.9	33.3
2	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	151.79 X 149.31 X 149.33	22664	8.505	730.6	32.2	
3	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	151.77 X 150.60 X 149.44	22857	8.394	773.1	33.8	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2018-12-31-139 **Date: 04/02/2019**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 30-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 04/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	149.80 X 149.72 X 149.54	22428	8.327	566.6	25.3	25.2
2	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	150.00 X 150.78 X 150.29	22617	8.125	596.3	26.4	
3	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	151.74 X 151.43 X 149.94	22979	8.246	551.9	24.0	

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TEST REPORT OF CEMENT CONCRETE CUBES

Date: 25/02/2019

Lab ID	:	**CP-2018-12-31-139**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	30-01-2019
Customer ID	:	Cement Concrete Pavement
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M30 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	25/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	149.07 X 149.72 X 150.68	22318	8.323	739.2	33.1	33.1
2	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	151.87 X 150.38 X 149.83	22838	8.505	746.8	32.7	
3	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	150.01 X 150.39 X 151.82	22559	8.394	756.9	33.6	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-12-31-139** **Date: 04/02/2019**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 30-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 04/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	149.17 X 149.45 X 151.75	22292	8.327	561.6	25.2	25.5
2	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	151.92 X 149.60 X 151.94	22728	8.125	600.7	26.4	
3	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	149.06 X 150.76 X 150.73	22473	8.246	560.9	25.0	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2018-12-31-139 **Date: 25/02/2019**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 30-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 25/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	150.71 X 151.01 X 151.55	22760	8.323	771.9	33.9	33.2
2	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	149.13 X 150.60 X 150.40	22459	8.505	723.1	32.2	
3	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	150.99 X 150.50 X 149.52	22723	8.394	763.7	33.6	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-12-31-139** **Date: 04/02/2019**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 30-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 04/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	151.63 X 149.04 X 151.00	22599	8.327	569.4	25.2	25.4
2	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	149.62 X 149.05 X 150.53	22301	8.125	594.3	26.6	
3	Cement Concrete Pavement	M30	28/01/2019	04/02/2019	151.55 X 149.10 X 149.40	22596	8.246	547.4	24.2	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-12-31-139**

Date: 25/02/2019

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 30-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 25/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	149.95 X 149.68 X 149.34	22444	8.323	745.1	33.2	33.1
2	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	151.43 X 149.04 X 150.40	22569	8.505	736.5	32.6	
3	Cement Concrete Pavement	M30	28/01/2019	25/02/2019	149.33 X 151.22 X 151.32	22582	8.394	757.4	33.5	

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TEST REPORT OF CEMENT CONCRETE CUBES

Date: 05/02/2019

Lab ID	:	**CP-2018-12-31-139**
Project Name	:	Package no.3 (Package Consists of 21 Works)
Name of Work	:	Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.
Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	31-01-2019
Customer ID	:	Cement Concrete Pavement
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M30 / 7 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	05/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	151.89 X 150.30 X 150.30	22829	8.327	582.6	25.5	25.4
2	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	150.79 X 150.52 X 149.86	22697	8.125	590.3	26.0	
3	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	150.99 X 151.09 X 151.66	22813	8.246	559.8	24.5	

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TEST REPORT OF CEMENT CONCRETE CUBES

Date: 26/02/2019

Lab ID : CP-2018-12-31-139

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 31-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 26/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	150.35 X 151.99 X 150.12	22853	8.323	772.9	33.8	33.5
2	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	151.81 X 149.15 X 149.27	22643	8.505	742.2	32.8	
3	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	149.13 X 151.61 X 151.97	22610	8.394	767.9	34.0	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

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****End of Report****

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Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-12-31-139** **Date: 05/02/2019**

Project Name : Package no.3 (Package Consists of 21 Works)

Name of Work : Improvements and Asphalting to Roads and Drains at NTI Layout, Defence Layout, BEL Layout and Surrounding areas in Ward No. 09 Vidyaranyapura Sub Division.

Agency : Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.

Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 31-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 05/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	150.29 X 151.78 X 149.12	22810	8.327	592.0	26.0	25.5
2	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	151.66 X 151.88 X 151.57	23035	8.125	608.2	26.4	
3	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	151.74 X 150.22 X 149.21	22794	8.246	553.1	24.3	

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TEST REPORT OF CEMENT CONCRETE CUBES

Date: 26/02/2019

Lab ID : **CP-2018-12-31-139**

Project Name : Package no.3 (Package Consists of 21 Works)

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Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 31-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 26/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	149.73 X 149.65 X 151.54	22407	8.323	740.3	33.0	33.1
2	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	149.51 X 150.82 X 151.81	22550	8.505	726.6	32.2	
3	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	149.16 X 150.27 X 151.45	22414	8.394	759.8	33.9	

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TEST REPORT OF CEMENT CONCRETE CUBES

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Lab ID	:	**CP-2018-12-31-139**
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Agency	:	Sri.C.G.Chandrappa, #1C-301, 3rd Main Block, HRBR Layout, Kalyan Nagar Bangalore - 560043.
Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	31-01-2019
Customer ID	:	Cement Concrete Pavement
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M30 / 7 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	05/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	150.97 X 152.00 X 150.84	22947	8.327	590.2	25.7	25.8
2	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	149.43 X 150.22 X 149.07	22448	8.125	600.8	26.8	
3	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	150.67 X 151.06 X 151.65	22761	8.246	565.3	24.8	

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Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	31-01-2019
Customer ID	:	Cement Concrete Pavement
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M30 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	26/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	149.61 X 150.92 X 149.69	22579	8.323	762.9	33.8	33.3
2	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	150.63 X 151.47 X 151.35	22816	8.505	736.0	32.3	
3	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	149.06 X 150.35 X 150.58	22411	8.394	760.0	33.9	

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Work Order Ref : BBMP/EE/BTP/WO/148/2018-19

Date of Receipt : 31-01-2019

Customer ID : Cement Concrete Pavement

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M30 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 05/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	150.81 X 151.36 X 150.00	22827	8.327	592.7	26.0	25.6
2	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	151.37 X 149.67 X 149.88	22656	8.125	597.3	26.4	
3	Cement Concrete Pavement	M30	29/01/2019	05/02/2019	150.89 X 151.17 X 149.77	22810	8.246	557.8	24.5	

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Work Order Ref	:	BBMP/EE/BTP/WO/148/2018-19
Date of Receipt	:	31-01-2019
Customer ID	:	Cement Concrete Pavement
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M30 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	26/02/2019

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	149.80 X 151.26 X 149.56	22658	8.323	754.5	33.3	33.2
2	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	151.22 X 151.79 X 151.92	22954	8.505	752.4	32.8	
3	Cement Concrete Pavement	M30	29/01/2019	26/02/2019	151.12 X 150.63 X 151.82	22764	8.394	763.1	33.5	

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